$$\Rightarrow \sum_{k=1}^{n} \frac{1}{\sqrt{n^2+n}} \leqslant u_n \leqslant \sum_{k=1}^{n} \frac{1}{\sqrt{n^2+1}}$$

$$\Rightarrow \boxed{\frac{n}{\sqrt{n^2+n}} \leqslant u_n \leqslant \frac{n}{\sqrt{n^2+1}}}$$

2)a) $\lim\limits_{n\to+\infty} \dfrac{n}{\sqrt{n^2+n}} = \lim\limits_{n\to+\infty} \dfrac{n}{n\sqrt{1+\frac{1}{n}}} = \boxed{1}$ ($\frac{1}{n} \to 0$)

$\lim\limits_{n\to+\infty} \dfrac{n}{\sqrt{n^2+1}} = \lim\limits_{n\to+\infty} \dfrac{n}{n\sqrt{1+\frac{1}{n^2}}} = \boxed{1}$ ($\frac{1}{n^2} \to 0$)

b) $\forall n \in \mathbb{N}^*$ $\dfrac{n}{\sqrt{n^2+n}} \leqslant u_n \leqslant \dfrac{n}{\sqrt{n^2+1}}$

et $\lim\limits_{n\to+\infty} \dfrac{n}{\sqrt{n^2+n}} = \lim\limits_{n\to+\infty} \dfrac{n}{\sqrt{n^2+1}} = 1$

D'où $\boxed{\lim\limits_{n\to+\infty} u_n = 1}$